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Conference Abstract

Phenology atlas use cases: a new map of plant phenology across North America and beyond

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Abstract

The goal of the phenology atlas workshop is to explore the development of a platform that would provide capabilities for analysing and visualising phenology data from multiple sources. The atlas would incorporate species-based, location-based and phenophase-based views. Here we provide an overview of potential phenology atlas use cases and present a conceptual framework that could be developed to construct generalizable models of plant phenology. Different species respond to different environmental cues; however, by co-opting statistical tools from the species distribution modelling (SDM) literature, it may be possible to construct flexible models that can be applied across species to capture timing of green up or first flower across North America (and beyond). This approach would allow us to generate a probability map of observing a particular species' phenological event in a particular location given climate and date.

As illustration, we present a simple model where phenology observations are a binary variable, and day of year and monthly climate data are predictors of observing the event. With such models, it could then be possible to tap into projected climate scenarios from General Circulation Models (GCMs), to construct future phenology scenarios. Linked with locality data, it might also be possible to make projections of when and which species will be flowering where (given a date in the future). This information might be interesting to researchers exploring novel species interactions and potential for phenological mismatches under future climate change.

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Keywords

Phenology, Climate change, Phenology atlas use case, Species distribution modeling (SDM), uture scenario predictions

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